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*Posets Isomorphisms in the Hopf Algebra of Tableaux*

This work is concerned with some properties of the Malvenuto–Reutenauer Hopf algebra of Young tableaux.

In the course of a recent study of the properties of four partial orders on Young tableaux, Taskin showed that the product of two tableaux of respective size  $n$  and  $m$  is an interval in each one of four partial orders defined on the set of tableaux of size  $n + m$ . We are interested in the relations between these intervals, with respect to the weak order on tableaux also called Young tableauhedron.

We want to show that for any quadruple  $(t_1, t_2, t_3, t_4)$  of standard Young tableaux such that  $t_1$  and  $t_3$  have the same shape  $\lambda$  while  $t_2$  and  $t_4$  have the same shape  $\mu$ :

- the intervals describing the products  $t_1 \times t_2$  and  $t_3 \times t_4$  are isomorphic and the isomorphism between the two intervals preserves the shapes of the tableaux.

And for any couple  $(t_1, t_2)$  of standard Young tableaux:

- the intervals describing the non commutative products  $t_1 \times t_2$  and  $t_2 \times t_1$  are isomorphic and the isomorphism between the two intervals preserves the shapes of the tableaux.